WHAT IS CLAIMED IS:

1. A knowledge driven composite design optimization process for designing a laminate part comprising steps for:

generating a globally optimized 3-D ply definition for a laminate part, said generating step further comprising steps for:

(1) determining connectivity between a plurality of regions defining the laminate part and substructure to which the laminate part is coupled;

(2) subsequently generating ramp features detailing interconnection of the regions defining the laminate part;

(3) displaying views and corresponding tabular data describing the laminate part and illustrating both inter-region connectivity and the ramp features as specified by a user; and

(4) optimizing local stacking sequences; and

(5) subsequently modifying the 3-D ply definition to include features of the laminate part,

wherein said generating and modifying steps are parametrically linked to one another.

2. The process as recited in claim 1, wherein:

said generating step further comprises generating the globally optimized 3-D ply definition for a laminate part using predetermined rules of laminate design practice; and

said modifying step further comprises subsequently modifying the 3-D ply definition to include features which locally violate said predetermined rules of laminate design practice for the laminate part.

3. A laminate part constructed using a knowledge driven composite design optimization process comprising steps for:

generating a globally optimized 3-D ply definition for a laminate part using predetermined optimal rules of laminate design practice, said generating step further comprises substeps for:

determining connectivity between a plurality of regions defining the laminate part and a substructure to which at least of the regions is coupled;

subsequently generating ramp features detailing interconnection of the regions defining the laminate part;

displaying views and corresponding tabular data describing the laminate part and illustrating both inter-region connectivity and the ramp features as specified by a user; and

optimizing local stacking sequences; and

subsequently modifying the ply definition to include features of the laminate part, said modifying step further comprising modifying the 3-D ply definition to include features which locally modify predetermined optimal rules of laminate design practice for the laminate part,

wherein said generating and modifying steps are parametrically linked to one another.

4. A knowledge driven composite design optimization process for designing a laminate part comprising:

a Parametric Composite Knowledge System (PACKS) module for generating a globally optimized 3-D ply definition for a laminate part in accordance with laminate design transition rules, said PACKS module including:

a connectivity subroutine for determining connectivity between a plurality of regions defining the laminate part and supporting substructures responsive to said transition rules;

a ramp definition subroutine for generating ramp features detailing interconnection of the regions defining the laminate part; and

a visualization subroutine for displaying views and corresponding tabular data describing the laminate part and illustrating both inter-region connectivity and the ramp features as specified by a user;

a stacking sequence subroutine for optimizing local stacking sequences;

and

a feature module including:

a subroutine for modifying the 3-D ply definition to include features which locally

modify the global ply solution;

wherein:

said PACKS and said features modules are parametrically linked to one another, and

the knowledge driven composite design optimization process applies said PACKS module and said features module in that order as a best practice,

said connectivity subroutine comprises a plurality of connectivity subroutines;

said transition rules determine a number of said plies which can be dropped between adjacent ones of said regions;

each said connectivity subroutine examines all of said plies with respect to a predetermined order to thereby determine which of said plies will be dropped between said regions, said predetermined order being defined with respect to a centerline ply and a tool surface; and

said connectivity subroutine, said ramp definition subroutine and said visualization subroutine are repeated seriatim until all of said connectivity subroutines have been utilized.

5. The process as recited in claim 4, wherein said transition rules determine a number of plies which can be dropped between adjacent ones of said regions and wherein said connectivity subroutine examines all of said plies in a predetermined order to thereby determine which of said plies will be dropped between said regions.

6. The process as recited in claim 5, wherein said predetermined order is freely selectable from a plurality of predetermined orders.

7. The process as recited in claim 5, wherein said predetermined order is defined with respect to a centerline ply and a tool surface.

8. A knowledge driven composite design optimization system used in designing a laminate part, comprising:

first means for generating a globally optimized 3-D ply definition for the laminate part in

accordance with laminate design transition rules, said first means including:

second means for determining connectivity between a plurality of regions defining the laminate part and a substructure responsive to said transition rules;

third means for generating ramp features detailing interconnection of the regions defining the laminate part; and

fourth means for displaying views and corresponding tabular data describing the laminate part and illustrating both inter-region connectivity and the ramp features as specified by a user; and

fifth means for modifying the 3-D ply definition to include features which locally modify the global ply solution;

wherein said first through fifth means are parametrically linked one to another,

wherein said first through fifth means operate in numerical order as a best practice,

wherein said first means further comprises sixth means for optimizing local stacking sequences, and

wherein said transition rules determine a number of plies which can be dropped between adjacent ones of said regions and wherein said second means examines all of said plies in a predetermined order to thereby determine which of said plies will be dropped between said regions.

9. The system as recited in claim 8, wherein said predetermined order is freely selectable from a plurality of predetermined orders.

10. The system as recited in claim 8, wherein said predetermined order is defined with respect to a centerline ply and a tool surface.

11. The system as recited in claim 8, wherein:

said second means is responsive to a plurality of connectivity subroutines;

said transition rules determine a number of said plies which can be dropped between adjacent ones of said regions;

each said connectivity subroutine examines all of said plies with respect to a predetermined order to thereby determine which of said plies will be dropped between said regions, said predetermined order being defined with respect to a centerline ply and a tool surface; and

said second through fourth means are repeatedly operated in numerical order until all of said connectivity subroutines have been utilized.

12. The system as recited in claim 8, wherein:

said second means is responsive to a plurality of connectivity subroutines;

said transition rules determine a number of said plies which can be dropped between adjacent ones of said regions;

each said connectivity subroutine examines all of said plies with respect to a predetermined order to thereby determine which of said plies will be dropped between said regions, said predetermined order being defined with respect to a centerline ply and a tool surface; and

said second through fourth and sixth means are repeatedly operated in that stated order until all of said connectivity subroutines have been utilized.